

Exploratory Use of Synthetic Aperture Radar Data (SAR) For Characterization of Phreatophyte Vegetation Communities Along the Lower Colorado River Floodplain

Jeff Milliken and Mary Balogh

FY 1999 - FY 2001

Specific phreatophyte vegetation information is needed by Lower Colorado River Accounting System (LCRAS)/River Operations Group for determining consumptive use of water and by the Resource Management Office for identifying, protecting, creating, and restoring endangered species habitat. Species composition, crown closure, and structure are critical attributes. This project focuses on testing the ability of Synthetic Aperture Radar (SAR) to provide a more cost efficient method of mapping these attributes through remote-sensed image processing.

SAR data will be acquired and tested to demonstrate the effectiveness of delineating vegetation characteristics, as described above. SAR data are also used to generate elevation data, and any additional information gained through this study will be presented.

This project is still in progress. Delays were experienced waiting for NASA JPL to deliver the radar data. Radar data was received by Technology Services Corporation (TSC - partner) in August 1999. TSC applied further pre-processing to the data, including georeferencing, despeckling, and edge enhancement. Fully polarimetric data was processed for P, L, and C bands. Existing Reclamation vegetation GIS layers and field data were delivered to TSC for use in the first phase of image classification. Reclamation met with TSC to review all data (Reclamation data and SAR data) and define methods for testing image classification products from this study. The first image classification was completed using fully polarimetric L and C bands and derivatives of these bands.

Analysis of correlation between vegetation classes based on Reclamation field data, and vegetation classes derived from the SAR imagery is the next step. Additional investigation of classification capabilities using P band data is also planned. TSC is primarily experienced with "target" identification using remote-sensed data. TSC personnel do not have a great deal of vegetation mapping experience. Future analysis of classification

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results relative to vegetation applications will be conducted primarily by Reclamation. Reclamation has received all image data from TSC for this purpose. Due to original delays in receiving image data, this project could extend into FY 2001.

NASA JPL, Technology Services Corporation.